

Introduction and Methodology Section

Presented to: Division of Alcohol and Drug Abuse  
State of South Dakota

By: Gary R. Leonardson, Ph.D.  
Mountain Plains Research  
55 Rodeo Trail  
Dillon, MT 59725  
406-683-6424  
mpr@zipmt.com

December 23, 2008

## Introduction

Alcohol and illicit drug abuse and addiction place enormous burdens on the country. As the number one health problem in America, it strains the healthcare system and contributes to the death and ill health of millions of people every year and to the high cost of health care. All population groups are subject to the ravages of substance abuse. People of all groups (i.e., men, women, all age groups, racial and ethnic groups, and people from various income and education categories) drink and use illicit drugs (Substance Abuse: The Nation's Number One Health Problem, The Robert Wood Johnson Foundation, Princeton, NJ, 2001).

Substance abuse affects not only the abusers themselves but also their families, friends, and society in general, harming family life, individual lives, the economy and public safety. It is estimated that the combined alcohol and drug abuse costs are more than \$325 billion each year for health care, the criminal justice system, insurance, financial support, and the loss of productivity and lives (Office of the National Drug Control Policy 2001; Substance Abuse Treatment Effectiveness in Tennessee, 2002).

Another source of information places alcohol abuse costs at \$166.5 billion per year with the proportion of the costs at 46% illness, 21% deaths, 12% medical, 11% other related costs, 9% crime, and 1% special conditions (U.S. Department of Health and Human Services, 1998). Illness losses were defined as the value of lost productivity due to illness or injury. Death losses considered the value of lost productivity due to premature death. Medical cost losses were health care expenditures, including alcohol and drug abuse services. Other related costs were motor vehicle crashes, fire destruction, and social welfare administration. Crime costs included direct costs (i.e., administration costs of the criminal justice system, property damage and private legal defense) and indirect costs (e.g., value of lost productivity related to victims of crime, incarceration and criminal careers).

A study conducted by the Harvard School of Public Health compared the cost-effectiveness of various medical, safety and behavioral interventions in terms of costs per year and lives saved. It found drug and alcohol treatment

to be in the top 10 percent. The study concluded that treatments for substance addiction were very cost effective with the programs saving more resources than they consume in comparison to the values of lives saved and health improvements (Institute for Health Care and Costs, 2003). Health care costs for individuals with addictions rise significantly prior to beginning alcohol and drug treatment and then fall dramatically following completion of treatment. A study by The National Evaluation Data Services found health care costs declined by 23 to 55 percent following alcohol and drug treatment (National Evaluation Data Services, 2002).

In South Dakota, persons with substance abuse problems are treated through a variety of funding sources, including private, State, and Federally sponsored programs. This report focuses on programs funded by Federal and State funds, as administered by the Division of Alcohol and Drug Abuse.

## **Division of Alcohol and Drug Abuse**

The Department of Human Services, Division of Alcohol and Drug Abuse, is responsible for prevention and treatment programs for alcohol and other drug abuse and gambling treatment services in South Dakota. The Division received and disbursed approximately 20.9 million in funds for fiscal year 2008. During fiscal year 2008 (July 1, 2007 - June 30, 2008) a total of 15,146 clients (unduplicated count) received services through 58 accredited treatment facilities within the State. These clients received services ranging from crisis intervention to structured treatment programs, with many of them receiving multiple services. Historically, funding for treatment services has been based on an agency's production of units of service that were provided to clients. The Division presently evaluates program services by assessing the number and types of services provided throughout the state. Additionally, a comprehensive assessment outcome study is utilized to assess the success of programs for indigent outpatient and inpatient treatment clients.

**Mission Statement of the Division of Alcohol and Drug Abuse:** To reduce the prevalence of substance abuse disorders through prevention and treatment services.

### **Priority Goals of the Division of Alcohol and Drug Abuse**

- Continue to provide funding for the operation of a comprehensive alcohol and drug prevention and treatment continuum for adolescents at the community level, including relapse programming for youth.
- Continue the development of co-occurring treatment programs for those individuals with alcohol and/or drug and mental health issues.
- Continue to operate specialized treatment programs for those clients addicted to methamphetamines.
- Continue the operation of alcohol and drug programming for the adult and juvenile offenders within the correction's system.
- Continue specialized treatment services for pregnant women and women with dependent children, including community-based case management services for pregnant women and women with dependent children assessed as being at high risk for substance abuse issues.
- Continue the funding for gambling treatment services.
- Continue outreach services for high risk populations.
- Continue the operation of the intensive meth treatment program (IMT) for women with the Women's prison who have a meth diagnosis.

Of the projected 4.8 million dollars flowing to South Dakota in FY07 from the Substance Abuse Prevention and Treatment (SAPT) Block Grant, at least 95% is spent on prevention and treatment activities for alcohol and other drugs. This includes the 20% set aside for primary prevention activities.

Also included in the FY08 expenditures was \$2,133,878 which was used for substance abuse services for the Corrections based Substance Abuse Programs and the IMT Program for meth addicted women within the States Women's Prison. In addition, \$1,312,770 was spent in general and other funds on specialized meth treatment programming for those women who completed the IMT program and were placed

in community programming at the time of parole, and in the two specialized community-based meth treatment programs.

Currently, the SAPT and general fund dollars for prevention and treatment are contracted to a wide variety of accredited agencies that provide alcohol and/or drug services in one or more of the following service categories: (1) Prevention; (2) Level 0.5 Early Intervention; (3) Level I Outpatient Treatment; (4) Level II.1 Intensive Outpatient Treatment; (5) Level II.5 Day Treatment (6) Level III.2-D Clinically-Managed Residential Detoxification; (7) Level III.1 Clinically-Managed Low Intensity Residential Services; and (8) Level III.7 Medically-Monitored Intensive Inpatient Treatment for Adolescents and Adults. The American Society of Addiction Medicine Patient Placement Criteria for Substance-Related Disorders (ASAM-PPC-2, Revised) is used as a clinical guide in matching clients to appropriate levels of care.

## **Types of Treatment Services**

**A. INTENSIVE INPATIENT TREATMENT:** A residential treatment program of subacute care, which provides medically monitored structured and intensive treatment for chemically dependent clients.

**B. INTENSIVE OUTPATIENT TREATMENT:** A non-residential program which provides chemically dependent/abuse clients a clearly defined, structured, intensive treatment program on a scheduled basis.

**C. OUTPATIENT SERVICES PROGRAM:** A non-residential program which provides chemically dependent/abuse clients a clearly defined, structured treatment program on a scheduled basis.

**D. EARLY INTERVENTION PROGRAM:** A non-residential program that provides early intervention services to individuals who may have substance use related problems, but do not appear to meet the diagnostic criteria for Substance-Related Disorder. The program provides initial assessment, intervention, alcohol and drug education and referral.

**E. RESIDENTIAL DETOXIFICATION:** A clinically managed residential detoxification program providing for the supervised withdrawal from alcohol or drugs of persons without known serious physical or immediate psychiatric

complications. The program furnishes temporary care, information, counseling, evaluation and referral, and provides for entry into the continuum of treatment services.

**F. CLINICALLY-MANAGED LOW-INTENSITY RESIDENTIAL PROGRAM:** A residential, peer-oriented treatment program of subacute care designed to aid the client's re-entry into society. The program must provide direct alcohol and drug counseling, and support service counseling by referral. The programs provide case management services that will help clients to find employment, and to coordinate other services as may be necessary to facilitate the client's successful re-entry into the community.

**G. DAY TREATMENT PROGRAM:** Day treatment is a non-residential program providing a minimum of 20 hours of structured intensive treatment services per week. Phase I clients are involved in the Day Treatment Program while living at the facility.

**H. (SLIP SLOT) INTENSIVE OUTPATIENT TREATMENT:** A non-residential program which provides chemically dependent/abuse clients a clearly defined, structured, intensive treatment program on a scheduled basis. There is special emphasis on relapse prevention planning. Clients in this category must receive prior approval by the Division of Alcohol and Drug Abuse. Clients who attend this program also receive services in the clinically managed low-intensity residential treatment program.

## **Outcome Methodology**

### **Target Populations for Study**

The targeted populations for the pre-test and follow-up procedures include adults and adolescents in community-based treatment programs funded by the Division of Alcohol and Drug Abuse with SAPT Block grant funds. Additionally, adolescents and adults in treatment programs associated with Department of Corrections (DOC) facilities or programs, along with community-based gambling treatment programs are part of the outcome studies procedures.

## **Data Collection**

Clients in the five targeted (community-based adolescent, adult substance abuse, gambling, and DOC adolescents and adults) treatment programs are administered Intake, History, Discharge, and Informed Consent forms after admission to the programs. A Follow-up form is completed at one year post-treatment. The adolescent and adult forms are different. Most of the forms (CATOR) were carried over from the previous outcome studies contractor and are used by permission. The completed forms are sent to Mountain Plains Research by the treatment programs in two separate shipments. The Intake, History, and Discharge forms are sent with ID numbers only. The Consent forms and Log Sheets, which contain names and addresses, are sent in separate mailings, maintaining the confidentiality of the clients.

### ***Intake Form***

The Intake form collects basic demographic information (age, sex, marital status, education, employment, etc.), along with referral sources, and types of substances used.

### ***History Form***

The History form contains detailed information on the client's past substance use, some demographic information, work history, family substance use history, physical abuse, sexual abuse, mental health, criminal justice, medical, accident, and related factors.

### ***Discharge Form***

The Discharge form collects information on type of program, program completion status, discharge status, family participation in program, post-discharge referrals, and related information.

### ***Informed Consent***

The Consent form obtains permission to follow-up the clients along with information on the clients' 'significant others,' and other contact persons.

### ***Follow-up Form***

The Follow-up form asks information that corresponds with intake and history information so that comparative pre- and post-information can be assessed. Additionally, the clients are asked to relate/assess their treatment program experiences, resulting in valuable information about strengths and weaknesses of the various programs.

For the community-based programs, phone interviewers are used to obtain follow-up information from structured interviews. At least five attempts are made at varying times and days of the week for the phone interviews.

For those without phones but who have current mailing addresses, the same questionnaire is sent via mail to the clients for completion. A small incentive (\$5.00 gift certificate) is provided for those completing the mail survey. The interviews/surveys are conducted 12 months post-treatment with multiple opportunities provided for clients to respond.

For persons in DOC programs, the follow-up forms for adults are administered by the parole officers and for juveniles by Juvenile Correction Agents (JCA's). A pilot project was conducted in which adults were contacted by phone using the same process and forms as the community-based programs. This procedure was discontinued because of the cost considerations and difficulty in obtaining information on current status (e.g., in prison, on parole, etc.) of the clients.

### **Inclusion Criteria for the Outcome Studies Population for the Community-Based Program**

1. The client's treatment was funded by the SAPT Block Grant or Title 19 funds; and,
2. The client completed the treatment program and all the required forms; and,
3. The client consented to participate in the outcome study.



### **Exclusion Criteria for the Outcome Studies Population for the Community-Based Program**

1. The client did not complete the treatment program.
2. The client did not sign the consent form and/or complete the other required forms.
3. At the time of the follow-up the client did not have a valid phone number or address, no contact person, and/or the contact person could not be located.
4. The client was institutionalized in jail/prison or other facilities that inhibited or forbade contact with client.
5. The client was deceased.
6. The client refused to be interviewed at time of follow-up.

### **Sample Considerations of Study Population-Adults Community Programs**

Of the adults in community-based programs who could be contacted, a large majority (78.7%) completed the follow-up survey. About half of the adult clients were excluded because of insufficient (or outdated) phone or address information, which is consistent with the transient nature of many of the clients.

In considering the adolescents in community-based programs who could be contacted, an impressive number (78.7%) completed the follow-up survey. About half of the adolescent clients were excluded from the sample because of insufficient (or outdated) phone or address information. The number of follow-up surveys completed, as reported below for both adults and adolescents, is smaller than those reported on the outcome segment, because the reasons for exclusion were not available early in the project.

**Adults Participating in the Outcome Study-Community-Based Programs**

|  |                             |       |
|--|-----------------------------|-------|
| Adult clients who consented to participate |                             | 7512  |
| Excluded from sample                       |                             | 4434  |
|  | No Phone, Address, or Moved | 4020  |
|  | Institutionalized           | 210   |
|  | In Treatment                | 25    |
|  | Deceased                    | 28    |
|  | Refused to Participate      | 151   |
| Eligible for Follow-up                     |                             | 3078  |
| Follow-up Interviews Completed             |                             | 2423  |
| Follow-up Interviews Not Completed         |                             | 655   |
| Follow-Up Rate for those Eligible          |                             | 78.7% |

**Adolescents Participating in the Outcomes Study- Community-Based Programs**

|   |                             |       |
|---|-----------------------------|-------|
| Adolescent clients who consented to participate |                             | 1124  |
| Excluded from sample                            |                             | 646   |
|   | No Phone, Address, or Moved | 570   |
|   | Institutionalized           | 31    |
|   | In Treatment                | 28    |
|   | Deceased                    | 2     |
|   | Refused to Participate      | 15    |
| Eligible for Follow-up                          |                             | 478   |
| Follow-up Interviews Completed                  |                             | 376   |
| Follow-up Interviews Not Completed              |                             | 102   |
| Follow-Up Rate of those Eligible                |                             | 78.7% |

**Basic Research Design**

A basic pre-test/post-test design without control groups is used to assess the outcome results. The follow-up questionnaire for the community-based program clients is administered via phone and supplemented by mail surveys sent to those without phones (if addresses are available). For the DOC program, parole officers (adults) and Juvenile Corrections Agents (adolescents) complete the forms for clients at 12 months post-placement or termination of parole (adults) or aftercare (probation) for adolescents.

**Sampling Design**

A non-probability sampling design is used in the outcome studies. In actuality, all clients are targeted for follow-up in all five populations. The only reasons persons are not contacted include: no consent form, no

known address/phone number, deceased, or institutionalized. Attempting to contact all clients is believed to be superior to random (or other procedure) sampling methods for the following reasons:

1. With small sample sizes, as per sampling, it would not be feasible to compare individual programs.
2. Many indigent clients do not have permanent addresses, therefore finding replacement persons for the sampling design would be tenuous at best. It is unknown in advance who can be located during follow-up.
3. Because the outcome studies are an ongoing, continuous procedure with follow-ups administered 12 months after treatment, there is not a point in which all pre-test information and consent forms are available for random sampling purposes for the entire year.
4. Because clients can decline participation in the initial data collection and subsequent follow-up procedures, the population of study participants may differ from the population of persons completing treatment.

### **Federal Guidelines on Informed Consent**

Based on the Section 46.116 of the Federal Policy for the Protection of Human Subjects informed consent allows "that participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which the subject (client) is otherwise entitled, and the subject (client) may discontinue participation at any time without penalty or loss of benefits to which the subject (client) is otherwise entitled."

### **Statistical Procedures**

Generally the traditional probability level of less than or equal to .05 was used for determining statistical significance. In the case of the non-response analysis the Bonferroni procedure (.05/number of independent analyses) was used to correct for multiple comparisons on the same data set. Percents, frequencies, means, standard deviations, correlational analysis, t-test, Chi-square, crosstabs, and regression procedures were used to analyze and present the information.

## **Data Integration and Analysis**

To test the effectiveness of the treatment programs and to assess demographic, social, and personal factors related to outcome factors, admission data were integrated with the follow-up information. Computer software used to enter, store, and analyze the data include Microsoft Access, Microsoft Excel, Epi Info, SPSS, and SAS.

### **Analysis of Non-Responses: Adults in Community-Based Programs**

Overall, there were some differences and similarities between adults who completed the follow-up surveys and those who were excluded (mainly because they couldn't be located) from the study, based on intake information. For 12 of the 14 factors (e.g., age, gender, native language, marital status, education, disability, welfare, reasons for entering treatment) assessed there were not any statistically significant differences between the two groups. There were significant differences in two main areas: ethnicity and employment status. Those who could be located were less likely to be Native American, and less likely to be employed.

### **Analysis of Non-Responses: Adolescence in Community-Based Programs**

Overall, there were not major differences between adolescents in community-based programs who completed the follow-up surveys and those who were excluded. For 8 of the 9 factors (age, grade past, gender, adopted, twins, court ordered, school status, and family income) there were not any statistically significant differences between the two groups. There was a significant difference in one area. Those who could be located were less likely to be Native American and more likely to be White than were the excluded persons. The results are based on a sample (n = 1792) of clients who entered treatment since 2005.

### Analysis of Non-Responses: Adults Community Programs

| Factor                         |                          | Clients with Completed Follow-ups % | Clients Excluded or with Incomplete Follow-ups % | Statistical Significance |
|--------------------------------|--------------------------|-------------------------------------|--|--------------------------|
| Age                            |                          | 34.0 yrs                            | 32.9 yrs   | ns (.02)                 |
| Gender                         | Males                    | 65.9                                | 62.0   | ns(.13)                  |
|                                | Females                  | 34.1                                | 38.0   |                          |
| Ethnic                         | Native American          | 15.0                                | 30.0   | P < .001                 |
|                                | White                    | 85.0                                | 68.0   |                          |
| Native Language                | English                  | 99.7                                | 98.5   | ns(.13)                  |
|                                | Spanish                  | 0.0                                 | 0.8  |                          |
|                                | Other                    | 0.3                                 | 0.8  |                          |
| Marital Status                 | Never Married            | 50.7                                | 54.0   | ns(.22)                  |
|                                | Divorced                 | 22.8                                | 23.8   |                          |
|                                | Separated                | 4.8                                 | 7.3  |                          |
|                                | Widowed                  | 1.7                                 | 1.4  |                          |
|                                | Married                  | 20.0                                | 13.4   |                          |
| Highest Degree                 | None Received            | 11.7                                | 15.1   | ns(.06)                  |
|                                | HS/GED                   | 67.5                                | 66.1   |                          |
|                                | Voc Tech                 | 11.5                                | 11.8   |                          |
|                                | A.S./A.A.                | 4.0                                 | 3.6  |                          |
|                                | B.S./B.A.                | 4.5                                 | 2.9  |                          |
|                                | M.S./M.A.                | 0.6                                 | 0.3  |                          |
|                                | M.D./J.D./Doc            | 0.3                                 | 0.2  |                          |
| Receiving Disability           | Yes                      | 6.0                                 | 5.6  | ns(.66)                  |
|                                | No                       | 94.0                                | 94.4   |                          |
| Receiving Welfare              | Yes                      | 3.9                                 | 4.8  | ns(.09)                  |
|                                | No                       | 96.1                                | 95.2   |                          |
| Reasons for Entering Treatment | DWI/DUI                  | 46.8                                | 40.5   | ns (.15)                 |
|                                | Other Court Action       | 30.5                                | 36.7   | ns (.87)                 |
|                                | In lieu of Incarceration | 8.3                                 | 10.2   | ns(.56)                  |
|                                | Ultimatum from Employer  | 1.5                                 | 1.4  | ns(.29)                  |
|                                | Ultimatum from Spouse    | 3.7                                 | 4.1  | ns(.59)                  |
| Employment                     | Full Time                | 45.5                                | 37.9   | P < .001                 |
|                                | Part Time                | 11.5                                | 12.0   |                          |
|                                | Unemployed               | 33.1                                | 40.7   |                          |
|                                | Other                    | 9.9                                 | 10.0   |                          |

ns = not significant

.05/14 = .004 (the adjusted probability level Bonferroni correction)

### Analysis of Non-Responses: Adolescents Community Programs

| Factor                |                            | Clients with Completed Follow-ups % | Clients Excluded or with Incomplete Follow-ups % | Statistical Significance |
|-----------------------|----------------------------|-------------------------------------|--|--------------------------|
| Age                   |                            | 16.6                                | 16.4   | ns (.25)                 |
| Highest Grade Past    |                            | 8.9                                 | 8.7  | ns (.07)                 |
| Gender                | Males                      | 55.5                                | 58.7   | ns (.26)                 |
|                       | Females                    | 44.5                                | 41.3   |                          |
| Ethnic                | White                      | 43.8                                | 26.1   | P < .002                 |
|                       | Hispanic                   | 2.3                                 | 1.3  |                          |
|                       | Black                      | 0.8                                 | 1.6  |                          |
|                       | Native American            | 46.2                                | 62.0   |                          |
|                       | Biracial                   | 6.2                                 | 8.3  |                          |
|                       | Other                      | 0.8                                 | 0.7  |                          |
| Adopted               | Yes                        | 4.6                                 | 3.2  | ns (.44)                 |
|                       | No                         | 95.4                                | 96.8   |                          |
| Twin                  | Yes                        | 2.9                                 | 3.7  | ns (.43)                 |
|                       | No                         | 97.1                                | 96.3   |                          |
| Court Ordered         | Yes                        | 60.8                                | 55.4   | ns (.32)                 |
|                       | No                         | 39.2                                | 44.5   |                          |
| Current School Status | Currently in School        | 80.1                                | 74.3   | ns (.08)                 |
|                       | Suspended                  | 1.8                                 | 1.7  |                          |
|                       | Expelled                   | 1.8                                 | 2.5  |                          |
|                       | Quit School                | 5.2                                 | 7.0  |                          |
|                       | Working on GED             | 7.8                                 | 12.1   |                          |
|                       | Graduated from High School | 3.4                                 | 2.4  |                          |
| Family Income         | < \$10,000                 | 24.4                                | 28.9   | ns (.04)                 |
|                       | \$10,001-\$20,000          | 18.3                                | 20.7   |                          |
|                       | \$20,001-\$30,000          | 15.0                                | 10.2   |                          |
|                       | \$30,001-\$40,000          | 6.6                                 | 5.0  |                          |
|                       | > \$40,000                 | 6.1                                 | 3.0  |                          |
|                       | Not reported               | 29.6                                | 32.2   |                          |

ns=not significant

.05/9 = .006 (the adjusted probability level)

## **Limitations of the Outcome Study**

1. Because of the indigent nature of the clients, many are very mobile and are difficult to locate 12 months post-treatment. It is unknown if these clients have better or worse outcome performance levels than the clients who can be located.
2. There are varying procedures for collecting outcome results and the survey instruments are not the same for the five populations. It is not feasible to compare the results of the community-based programs with the criminal justice based programs because of these differences. The instruments were originally designed to collect information unique to the separate environments. Additionally, adults and adolescents have different standardized instruments because of differing maturity and educational levels. In the future it may be beneficial to find or develop common intake and outcome measures for all groups.
3. Most of the information from the intake and outcome instruments is based on the self-perceptions and/or self-reports of the clients. The self-reported information may bias the results of the analyses.
4. Some of the information is missing from the clients' data forms, although the overall rate of completed information by questions is more than 97 percent, which is very good for these types of clients and instruments. The limited amount of missing information is not believed to alter the results of the data analyses, since the missing information by question appears to be random and not systematic.
5. The data collected from the programs are not always conducted in a consistent manner, because of staff turnover or degree of attention to detail and/or the program's perception of the importance of data collection and program evaluation. Data discrepancies are handled expeditiously between the outcome studies contractor (MPR) and the various individual programs. Overall, the programs are very responsive to correcting data deficiencies should they occur. There have been no consistent major problems with the data collection. The most common problem is missing information (e.g., signatures, contact persons, addresses, phone numbers) on the consent form. In addition, a few programs are uneasy about using social security numbers and

use alternative ID's, which makes for additional work for the programs and the outcomes contractor.

## **Cost-Effectiveness of Treatment**

Substance abuse treatment has been found to be effective and cost saving. Effective treatment programs have been shown to save taxpayers approximately \$9,177 per client. Most of this amount (94%) is realized through reduced crime-related results, some (4%) was from clients' increased earnings, and the rest (2%) was from decreased health care costs (Center for Substance Abuse Treatment, 2000).

A study in California was undertaken to assess the benefits of treatment (Gerstein, Johnson, Harwood, Fountain, Suter, and Malloy, 1994). The results are summarized below.

### **Summary of Key Findings from a Large Cost-Benefit Study in California:**

- ◆ **Total Cost and Savings for One Year:** Taxpayers paid \$209 million in treatment costs, but received \$1.5 billion in savings.
- ◆ **Daily trade-off:** Each day of treatment paid for itself (the benefits of taxpaying citizens equaled or exceeded the costs), primarily through avoidance of crime and increased health and employment benefits.
- ◆ **Cost-benefit ratios for taxpaying citizens:** The benefits of alcohol and other drug treatment outweighed the costs by ratios from 4:1 to greater than 12:1 depending on the type of treatment. That is, there are between \$4 and \$12 in benefits to taxpayers for every dollar invested in treatment, depending upon type (outpatient, residential) of treatment and substance used (alcohol, cocaine, etc.). The cost benefit in this study averaged \$7 return for every dollar invested.



### **Types of Treatment Effectiveness in California Study:**

- ◆ **Crime:** The level of criminal activity declined by two-thirds from 'before' treatment to 'after' treatment. The greater the length of time spent in treatment, the greater the percent reduction in criminal activity.
- ◆ **Alcohol/Drug Use:** Declines of approximately two-fifths occurred in the use of alcohol and other drugs from 'before' treatment to 'after' treatment.
- ◆ **Health Care:** About one-third reduction in hospitalizations was reported from 'before' treatment to 'after' treatment. There were corresponding significant improvements in other health indicators.
- ◆ **Employment and Economic Situation:** Overall, treatment did not have a positive effect on the economic situation of the participants during the study period. However, data indicate that longer lengths of stay in treatment have a positive effect on employment. This finding is greater for those in the social model or other residential programs than for other treatment types. The largest gains in employment occur with those individuals staying in treatment beyond the first month.

## **Assessment of Economic Benefits of Completing Substance Abuse Treatment Programs in South Dakota**

Five areas of savings or benefits were assessed, based on client information available from outcome studies in South Dakota, along with statewide and national financial information. The five areas assessed were: days worked, days of lost work, criminal justice-arrests, criminal justice-prison, and healthcare costs. The total dollar benefit values are not inclusive of all possible benefits associated with completing substance abuse treatment programs in South Dakota.

One area assessed was the numbers of days employed. Before treatment (based on more than 1000 persons followed 12 months after treatment), about two-thirds (66.7%) of the clients were employed. Twelve months post-treatment a much higher percent (90.9%) was employed. In estimating the benefits per person, the percent employed for each time period was multiplied times the theoretical annual salary of \$20,000. The median household income in 2000 in South Dakota was \$39,265 (Source: U.S. Census Bureau, Demographic Surveys Division, Continuous Measurement Office, 2004).

Another employment factor utilized was the number of days of lost work per year. Before treatment the clients averaged 40.8 days of missed work per year. During the year following treatment, the number of missed days at work was only 14.4 per year. The \$20,000 annual salary is about \$77 per day.

The criminal justice costs add to the cost-benefit of treatment, because of the high arrest rate of persons with substance abuse problems. Before treatment 75 percent of the clients had been arrested, but the percent of clients arrested 12 months post-treatment was significantly less at 18.5 percent. The cost per arrest was determined by dividing the estimated cost of operating police and/or sheriffs' offices in South Dakota in 2006 by the number of persons arrested in South Dakota in 2006. The arrest costs would include all facets of local law enforcement, including the cost of operating local jails, if applicable.

The computation of direct costs for prison is more complex to assess, but the following methodology is offered. The average cost for housing prisoners in South Dakota is about \$40 per day or about \$14,600 per year. For

every intake into the prison system in South Dakota in 2002, there was an average of about 22 arrests during the same period of time. Using the number of 22 arrests equals 1 incarceration for one year (to make it consistent with the other categories), the approximate costs for the average client for one year was calculated, based on the likelihood of arrest for the typical person in the treatment program at one year pre- and at one year post-treatment, respectively.

Healthcare costs were determined by days hospitalized times the average cost per day. The days hospitalized came from the outcome study forms. The amount per day was taken from national rates for 1995.

The cost of treatment was calculated from information provided by the Division of Alcohol and Drug Abuse in South Dakota in FY 07. There were 1851 persons for whom the Division paid for their treatment services in programs that were part of the cost-benefit segment of this report. Costs for these 1851 clients were tabulated from inpatient/residential treatment programs (\$614,920), outpatient treatment programs (\$1,141,759), West River-IOT (\$378,719), and the client's share (\$432,590) of the total counseling aftercare budget (\$761,852). The total budget (\$2,558,989) was divided by the number of clients (1851) to obtain the per client cost of treatment, which was \$1,382. The cost of treatment (\$1,382) was significantly less than the benefits (\$13,940), resulting in a very favorable cost-benefit ratio. The cost benefit in this study was \$10.09 for every dollar invested. The cost benefit results presented here are similar (although higher-\$10.09 compared to \$7.00) to those reported elsewhere (Center for Substance Abuse Treatment, 2000; Gerstein, Johnson, Harwood, Fountain, Suter, and Malloy, 1994).

### Estimated Savings Per Person in South Dakota Per Year for Completing Treatment

| Areas of Benefit                                 | Estimated Costs Before Treatment   | Estimated Costs After Treatment                                       | Estimated Benefits                 |
|--|--|---|------------------------------------|
| <sup>1</sup> Employment: days worked             | 66.7% employed year prior to treatment<br>@ \$20,000 per year = \$13,340 | 90.9% employed year after treatment<br>@ \$20,000 per year = \$18,180 | \$18,180-\$13,340 = <b>\$4,840</b> |
| <sup>2</sup> Employment: days not worked         | 40.8 days per year prior to treatment<br>@ \$77/day = \$3,142            | 14.4 days per year after treatment<br>@ \$77/day = \$1,109            | \$3,142-\$1,109 = <b>\$2,033</b>   |
| <sup>3</sup> Criminal Justice: Persons Arrested+ | 1.4 arrests per person year prior to treatment<br>@ \$4,441 = \$6,217    | .3 arrests per person year after treatment<br>@ \$4,441=\$1,332       | \$6,217-\$1,332= <b>\$4,885</b>    |
| <sup>4</sup> Criminal Justice: Prison            | 1.4 arrests per person equals .0636 years prison @ 14,600 = \$929        | .3 arrests per person equals .0136 years @ \$14,600=\$199             | \$929-\$199= <b>\$730</b>          |
| <sup>5</sup> Healthcare: Hospital                | 3.3 Days per year prior to treatment<br>@ \$968/Day = \$3,194            | 1.8 Days per year after treatment<br>@ \$968/Day = \$1,742            | \$3,194-\$1,742= <b>\$1,452</b>    |
| Total  |  |   | <b>Total = \$13,940</b>            |

+Rapid City police and safety budget in 2006 = \$11,068,527. In 2006 Rapid City had 8.0 percent of the state's population (62,647/781,919).

+\$11,068,527 divided by .08 = \$138,356,588 (estimated state budget).

+The number of arrests in South Dakota in 2006 was 28,662 based on 92 percent of the population represented by submitting law enforcement jurisdictions.

+28,662 divided by .92 = 31,154 (estimated number of arrests statewide).

+\$138,356,588 divided by 31,154 = \$4,441 (estimated cost per arrest).

<sup>1</sup> Employment percents from outcome studies of community-based treatment programs. Amount of job (\$20,000) was based on theoretical job amount.

<sup>2</sup> Employment days from outcome studies of community-based treatment programs. Amount (\$50) for missing days is based on 50 percent of salary.

<sup>3</sup> Arrest information is from outcome studies of community-based treatment programs. Costs per arrest is based on budget for Rapid City Police Department in 2006 prorated to a state amount, along with number of persons arrested in 2006 (from Crime in South Dakota 2006) prorated to state total. Total estimated budget in the state [divided] by number of arrests = \$4,885 per arrest. This is tentative pending finding all actual budgets for law enforcement in the state.

<sup>4</sup> Information is from South Dakota Department of Corrections.

<sup>5</sup> Number of days is from outcome studies community-based treatment programs. \$968 (1995 information) per day is from: "1997 Statistical Abstract of the United States", citing data from the American Hospital Association, Chicago IL, "Hospital Statistics," annual editions.

## References

Gerstein, D.R., Johnson, R.A., Harwood, H.J., Fountain, D., Suter, N, and Malloy, K. (1994). Evaluating recovery services: The California Drug and Alcohol Treatment Assessment (CALDATA) general report. Sacramento, CA: California Department of Alcohol and Drug Programs.

Center for Substance Abuse Treatment (CSAT). (2000). Cost-savings from treatment derived mostly from reduced crime. As quoted in Substance Abuse Treatment Effectiveness in Tennessee (2002), Department of Anthropology, The University of Memphis.

Substance Abuse: The Nation's Number One Health Problem (2002), Key Indicators for Policy: Prepared by the Schneider Institute for Health Policy, Brandeis University. The Robert Wood Johnson Foundation, Princeton, NJ.

Office of National Drug Control Policy (2001). The economic costs of drug abuse in the United States, 1992-1998 (Publication No. NCJ-190636. Washington, DC: Executive Office of the President.

Substance Abuse Treatment Effectiveness in Tennessee: 2001-2002 Statewide Treatment Outcome Evaluation (2002). Department of Anthropology, The University of Memphis.

Harwood H., Fountain, D. & Livermore, G. "The Economic Costs of Alcohol and Drug Abuse in the United States in 1992." Rockville, M.D.: U.S. Department of Health and Human Services, National Institute of Drug Abuse and National Institute on Alcohol Abuse and Alcoholism, 1998.

Institute for Health Care Costs and Solutions, Washington Business Group on Health Issue Brief, Solutions to Workplace Substance Abuse Prevention and Treatment Strategies January/February 2003 Vol2 No 1, 11.

Apgar, K. Miller C., et al., (citing Harwood, Malhortra, Villarivera, Lui, Chong, Gilani National Evaluation Data Services, Cost Effectiveness and Cost Benefit Analysis of Substance Abuse Treatment: A Literature Review U.S. Department of Health and Human Resources SAMHSA 2002, 12-13).